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PHILLIP M. CHERNOFF, D.D.S. is a graduate of the University of Pennsylvania (1922). Doctor Chernoff is a general practitioner who presents in this issue A NEW CONCEPT REGARDING APICOECTOMY.

LA MAR W. HARRIS, D.D.S. (Chicago College of Dental Surgery, 1929) was among the first research workers to report successes in new applications of plastics in the field of dentistry. His first report on this subject appeared in The DIGEST in June of this year: THE USE OF ACRYLIC RESIN FOR JACKET RESTORATION. In this issue, Doctor Harris reports new developments and refinements in his technique.

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Chemo-Therapy of Pyorrhea

JAMES MARK PRIME, D.D.Sc., Omaha

DIGEST

Pyorrhea is a local infection having contributing factors.

Problem: To eliminate the bacteria without contaminating the blood stream; to eliminate the pocket without injury to the tooth tissues; to reduce all trauma to a minimum.

Armamentarium: No expensive equipment is required. Cotton rolls, stainless steel cotton pliers; only occasionally an anesthetic; a mouth wash.

Drug: Howe's ammoniacal silver nitrate solution.

Treatment: The treatment which is applicable in the early stages protects the blood stream because operating is done in a sterile field. The procedure is outlined in detail.

PERHAPS MORE HAS been written about pyorrhea than any other subject in dentistry. Some confusion has developed from complicated terms. Although pyorrhea may not be the correct term, it is the old and well understood name for an old and little understood disease. A dental dictionary gives fifty-eight names as an "incomplete" list. No doubt there are as many remedies as names. New names for an old disease often serve to confuse rather than clarify. Clinical experiences seem to be the best guide in control of the disease.

Pyorrhea is treated first as a local infection; then, the contributing factors are considered. On this basis the results following a cauterizing, scaling, and curetting of these diseased crypts and pockets are understandable. In the presence of organisms waiting for further opportunity to progress deeper into the pocket, scaling and curetting of calculus (loaded with these bacteria) only push the bacteria deeper; more tissue is torn loose from the attachment, carrying the inoculation deeper and deeper; thus the pockets grow progressively deeper, sterile bone melts away, and the bifurcation or trifurcation becomes radiolucent. Bathed in the most highly infective fluid of the body, the operator passes his instrument through bacteria, débris, and pus to the bottom of the crypt or pocket to make a deeper inoculation. Where in all the annals of modern surgery can a parallel be found? Perhaps the only greater breach of surgical asepsis occurs when these diseased tissues are infiltrated with procaine, then with lance and curet tissues, both soft and hard, are incised in all this filth. (I have seen pus ooze from a pocket under the pressure of the anesthetic.

In the case of the pyorrhea-infested gingival trough there are no antibodies for a defense. There is never a walling-off of the infection. It becomes a veritable "pus flowing" river, with no levies, no dams, running wild. Twenty-four hours a day the two-way drainage goes on: one into the blood stream, the other into the stomach. This is perhaps a greater factor than is realized in bringing on earlier that age of degenerative diseases. Clinical experiences and observations are developing a large and growing belief that pyorrhea is a potent, vicious source of focal infection. Pyorrhea is almost universally present in adults, because of failure to recognize early symptoms.

The problem is to eliminate the bacteria without contaminating the blood stream; to eliminate the pocket without injury to the tooth tissues; to reduce all trauma to a minimum.

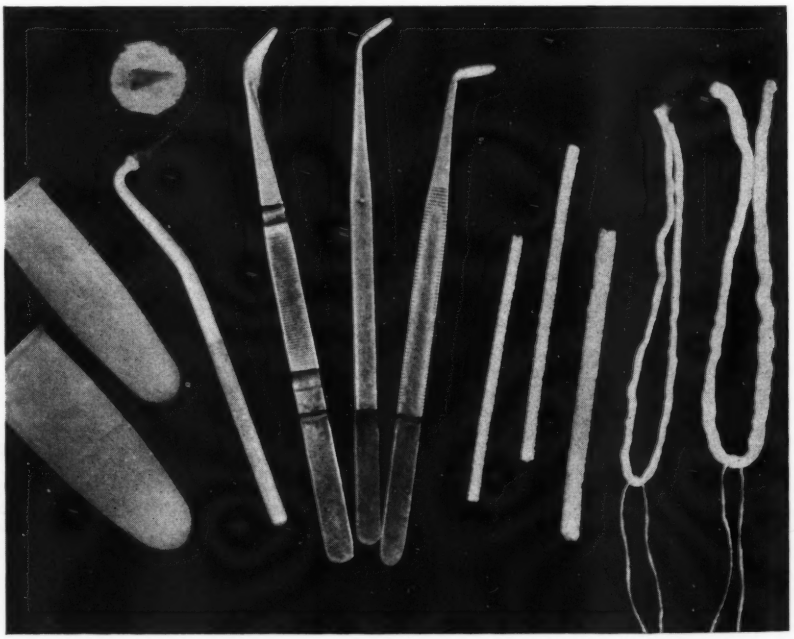


Fig. 1A Fig. 1B Fig. 1C Fig. 1D Fig. 1E

Fig. 1—Armamentarium: A) rubber finger cots to protect the fingers; B) interdental stimulator: rubber point; aluminum handle (extra point not well shown); C) pliers wrapped with cotton as described in text; D) sterilized pipe cleaners of two sizes: These are cut into lengths of from 2½ to 3 inches; E) prophylactic cords, made in six sizes. The floss is looped through the cords as shown. The contact is passed with the silk and the cords are drawn back and forth between the teeth. Length of cord is about 12 inches. Toothpaste is used as a lubricant on the cords. Stimulator and pipe cleaners are used by patient at home.

In the treatment to be described, no expensive instruments or equipment are necessary. No hospital, no surgical dressings, no sutures, rarely any anesthetics are required. Although I have not employed an anesthetic during the years I have used the treatment, there could be no serious objection to small amounts of local injections of an anesthetic should the operator choose to use it. Topical anesthetics have not met with success. The caustic solution itself seems to reduce sensation by destroying the small nerve fibers of coagulation.

The treatment of pyorrhea with a caustic drug is not new. The mineral acids, such as sulphuric, nitric, trichloracetic, and hydrochloric, have been used in various dilutions and combinations. These methods failed because the acids are decalcifiers. They increase the tendency to decalcification from caries. They increase hypersensitiveness rather than reduce it.

Requirements of Drug

The drug of choice must be highly germicidal and self-limiting in its tissue-cell-destroying property. Its action must be rapid and not penetrate beyond the point of actual application. It must have a *pH* value well over 7—this property is highly important, for from it is had the beneficial effect on exposed cementum.

Howe's ammoniacal silver nitrate meets these requirements almost ideally.

Technique

Preliminary Considerations — 1. Full-mouth roentgenograms are advised.

2. Inasmuch as the whole intention is to eliminate the infection and the diseased tissue pocket without contaminating the blood stream, no surgery—not even scaling—is done previous to the application of the chemical cautery.

3. CAUTION: The chemical cautery must be kept away from the lips and face. It will do little injury to mucous membrane so long as the tissue is covered with saliva. If the mucous membrane of the cheek is dried and the solution comes in contact with the dried surface, the epithelial cells will be destroyed. This usually peels off without the knowledge of the patient.

4. Armamentarium: Napkins and cotton rolls must be used liberally to keep the drug off the lips, where a blister will result from small quantities.

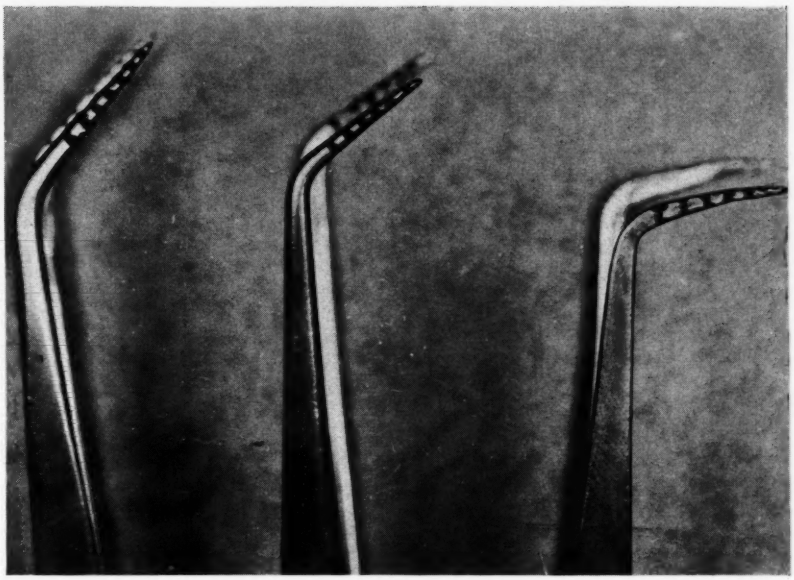


Fig. 2—Enlarged view of notched pliers.

Many forms of applicators have been tried. Cotton pliers seem to be adapted to the purpose. Stainless steel pliers are preferred. About four pairs are necessary to give access to the various positions and crevices.

5. Preparation of Pliers: The beaks of the pliers are trimmed down with a stone in the handpiece to make them slender and more pointed than the regular cotton pliers. They are notched slightly, so that the cotton will not slip off. A wisp of cotton is held between thumb and forefinger and wound tightly around the beaks. This cotton holds the two halves of the pliers firmly together.

Steps in Treatment—1. Fifteen or twenty drops of Howe's solution are put in a dappen dish and the cotton-covered beaks are dipped into this solution. The solution is not reduced when used for this purpose.

2. Gently introduce these cotton-covered beaks into the pocket or crevice to be treated with a light, pumping-like motion.

3. After a few seconds a back-and-forth movement is added to the pumping motion. This is continued deeper and deeper into the pocket, and if slow enough, little pain is produced.

4. The same cotton, although covered with coagulated albumin, and often mixed with some blood, is returned to the solution and more solution is picked up and returned to the point of treatment. The same cotton is used until the points of pliers are denuded of the cotton, after which a new piece of cotton is again wound around the beaks, as described. The amount of cotton depends somewhat on the size of the pocket or crevice to be treated.

This procedure is continued until the number of teeth to be treated at the sitting is completed.

5. When the saliva accumulates to the amount where spitting is indicated the field of operation is first flushed with a mouth wash. Care must be exercised here to keep the solution off the dry lips.

6. Immediately following the application of the solution, all deposits are removed with scalers. This is the time to scale, because the operator is working in a relatively sterile field surrounded with cauterized tissue, with a minimum amount of discomfort to the patient.

7. The treated crypts are now flushed out with the spray bottle containing half hydrogen dioxide and half water. No surgical dressings are used.

8. The patient is instructed to rinse the mouth thoroughly several times daily with hot salt water and to begin brushing about the third day, with a rather soft brush at first. The patient is advised to keep the treated pocket open with the interdental stimulator.

9. The tissues are examined in about one week and if there is any discharge on pressure the pocket is

treated again, the cauterization being carried to the bottom of the pocket where the granulated inflammatory tissues are found.

10. At a later sitting the roots are scaled, polished and freed of any remaining calculus, dead and irritating cementum. From this point on, the final results rest largely in the patient's home care.

Pack Method

When I first began using ammoniacal silver nitrate in the treatment of pyorrhea, I used it on cotton and packed the pockets with this cotton. These packs were left in place for from one to forty-eight hours. I have for the most part abandoned the pack method and use the technique described. I still use the pack method occasionally, however, when the tissues are hard and fibrous; when the pocket is extremely deep; when the pocket is hidden around a third molar; and when there is a radiolucency in a bifurcation or trifurcation of molars.

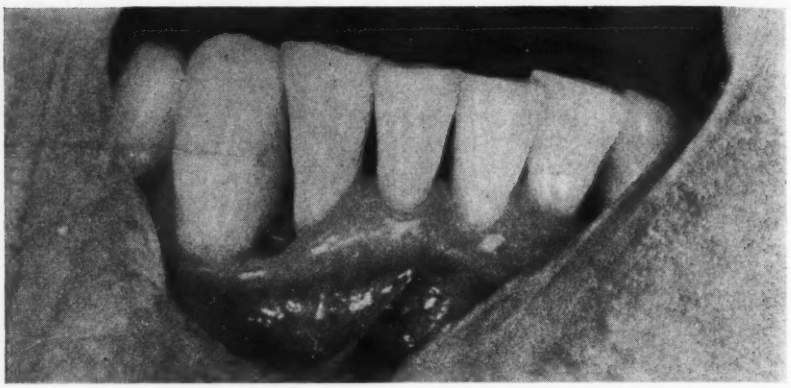


Fig. 3—Result of two treatments in a severe case.

Comments

This treatment presented here is applicable in the early stages of the disease. It is, therefore, an ideal preventive measure. It protects the patient's blood stream by avoiding operating in diseased tissue. Relief of symptoms of focal infection is almost immediate.

1136 *Medical Arts Building.*

NOTES ON THE

Cuff

This Is Station ADA: NOW—THIS MINUTE—TODAY . . .

Tucked in the corner of a drawer, away from everyday activities, are, I fear, many of the Christmas seals of the A. D. A. When the mail brought these seals to us about a month ago, we all meant to sit down and send in our checks; but somehow the undertow got in its licks and our good intentions were out of mind. So, as the radio announcers say, "Send in your check NOW—THIS MINUTE—TODAY." Send in your dollar or more today to the Relief Committee, American Dental Association, 212 East Superior Street, Chicago, Illinois.

Where does this money go that is collected every year in the sale of these Relief Seals? Who gets it? These are fair questions and deserve to be answered. First, we can say that not one cent is ever spent in investigation to determine the worthiness of any applicant for relief. Every investigation is made by dentists in the community where the applicant resides. These dentists are better able to discover and understand the plight of the dentist in need of relief than any paid investigator. No salaries are paid to the committee, officers, or members. They work diligently and at great sacrifice to help the lot of their less fortunate colleagues and not one cent ever goes for frills or fancies or to people who aren't entitled to urgent help. The money grants that are made to needy dentists buy bread and butter and pay rent and buy drugs and medicines for the ill. No one need fear that members receiving relief grants from the A. D. A. are living in grandeur or are malingering. Every member who is receiving help is desperately in need of it.

Let us take one typical case: For thirty-six years a dentist practiced in a community in the Middle West. He did a good job for his patients. He was respected in his community. He made a decent living from his profession. His children grew up, married, and left the family roof. Bright luck did not shine upon them. The wife and mother of the family died. Sickness overtook the dentist. What little he had saved after paying for his home and his children's education did not last long when it came to meeting the catastrophic expenses of a long drawn-out illness. Financial reserves built up through the years are quickly drained away to meet the expenses of sickness. This man's illness brought about his incapacitation for the practice of dentistry. His office rent was unpaid; his creditors began their insistent hammering; his family and friends could help no more; he was too proud to turn to public relief. But there was one agency to which he could turn and that agency came quickly to his aid—the American Dental Association Relief Committee. Send in your check NOW—THIS MINUTE—TODAY.

Never Send a Man on a Man's Errand . . .

There are people who should never be sent on errands. I am one of them. If I go to the country store for a can of kerosene, chances are that I will return with a pound of lard. This reputation saves me many trips in various kinds of weather. Only in a pinch does anyone suggest that the old man be pried loose from his rocking chair and sent forth. Recently the hired man on our little farm mentioned that he saw a good-looking drop-leaf kitchen table selling for $3.00 in the second-hand store, and with winter coming on, he thought it would be a fine acquisition for his kitchen. In a moment of expansiveness, I volunteered not only to buy the table for him but to fetch it as well.

As I bounced over the roads, twenty

(*Continued on page* 430)

A New Concept Regarding Apicoectomy

PHILLIP M. CHERNOFF, D.D.S., Middletown, Connecticut

DIGEST

1. The treatment of pulpless teeth should be referred to as "periapical therapy."

2. Apicoectomy is considered a conservative form of treatment because of the direct and uniformly satisfactory results.

3. Inaccessibility and mechanical inadequacy are contra-indications to apicoectomy.

4. Resection need apply only to the apex which alone is responsible for periapical disease. Thorough curettement of the sides is sufficient.

5. The step-by-step technique of apicoectomy is outlined and illustrated.

Fig. 1—Crescent-shaped incision, showing proper location.

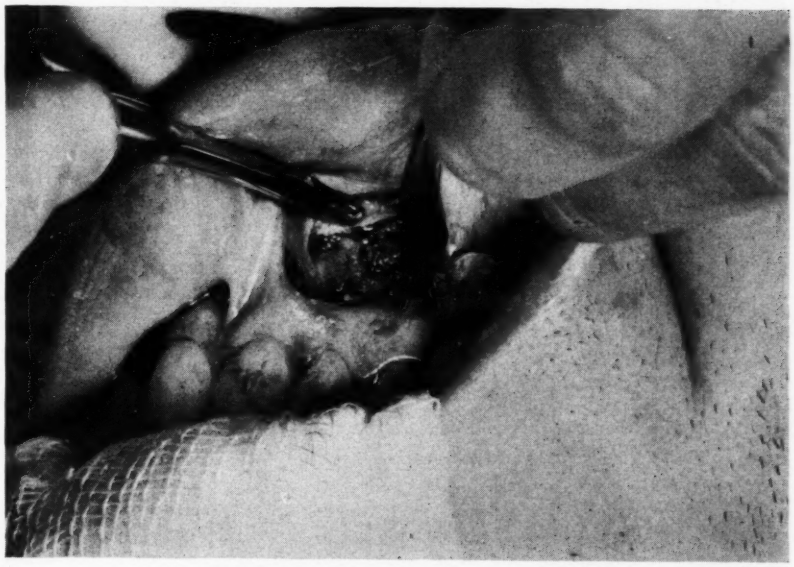


Fig. 2—Flap being retracted, showing outline of window.

IN A PREVIOUS article[1] I have discussed the rationale of apicoectomy. In this article, in addition to the graphic illustration of the technique, I would like to emphasize a few salient points.

The treatment of pulpless teeth should be referred to as "periapical therapy," and not by the common designation "root canal therapy," for the purpose of treatment is admittedly to alleviate or prevent untoward periapical reaction and the objective of treatment is concededly not root canal health *per se* but rather periapical health.

The most direct and most satisfactory periapical therapy is surgical. The dental literature is replete with reasons for the failures following the management of pulpless cases by medication alone. Hess[2] has demonstrated the existence of multiple ramifications at the apexes of teeth. Skillen[3], speaking of these accessory canals, states: "Certainly it would seem impossible to remove the contents of most of them." Jasper,[4] speaking of infected teeth, says: "The tissue in accessory canals is almost invariably infected." Obviously, the stubborn obstacle to success in the treatment of pulpless teeth is the apex. The problem is simply and quickly solved by apicoectomy.

Because the results that follow its performance are uniformly successful, I consider apicoectomy to be a conservative form of treatment. Immediately following apicoectomy the

[1]Chernoff, P. M.: The Surgical Treatment of the Pulpless Anterior Tooth, Connecticut State D. Bul. 17:29 (November) 1940.
[2]Hess, W.: Anatomy of the Root canals, New York, William Wood & Co., 1925.
[3]Skillen, W. G.: Morphology of Root Canals, J. A. D. A. 19:719 (May) 1932.
[4]Jasper, E. A.: Conservation of Pulp Involved Teeth, J. A. D. A. 23:1895 (October) 1936.

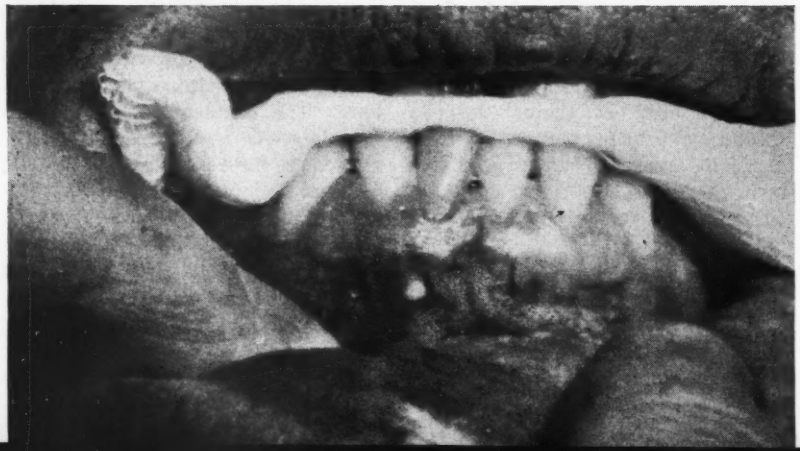


Fig. 3 (top)—Circumscribed island of bone pried out to make apex visible.

Fig. 4 (top, center)—Apex resected and bone cavity curetted.

Fig. 5 (bottom, center)—Incision sutured with three sutures: one at center and one at each end.

Fig. 6 (bottom)—Lower central with fistula.

process of periapical tissue activity is one of regeneration; whereas, following root canal medication alone the periapical reaction is too often one of degeneration. In view of this consideration apicoectomy should be employed as a first resort rather than as a last resort.

Several new ideas form the basis of a new concept regarding apicoectomy. Extensive bone destruction about the apex or along the root crown-wise does not constitute a contra-indication; nor does it have any bearing whatever on the prognosis. Resection need not be done at the limit of involvement—only the apex need be removed in any case, regardless of the degree of root involvement. The sides of the root, if involved, need only to be curetted after the apex has been resected, and a meticulous curettement will insure regeneration of all tissues. It must be remembered that only the apex is responsible for periapical disease, and regardless of the extent to which the sides of the root are involved, the sides do not contribute to that pathologic condition.

There are only two contra-indications for apicoectomy: inaccessibility and mechanical inadequacy. Inasmuch as most anterior apexes are surgically accessible, performance of apicoectomy on anterior teeth has only one contra-indication. Extensive periodontoclasia, root fracture, and a root perforation may constitute mechanical inadequacy. Periapical disease alone is not a valid reason for extracting anterior teeth.

Technique

The technique of apicoectomy is not difficult.

1. If a crescent-shaped incision is employed, it should not be made too near the gingiva, for if too narrow a strip of mucoperiosteum is left be-

Fig. 7 (top)—Type of flap most suitable for apicoectomy of lower anteriors. Note how the granuloma has broken through the labial alveolar plate in this case.

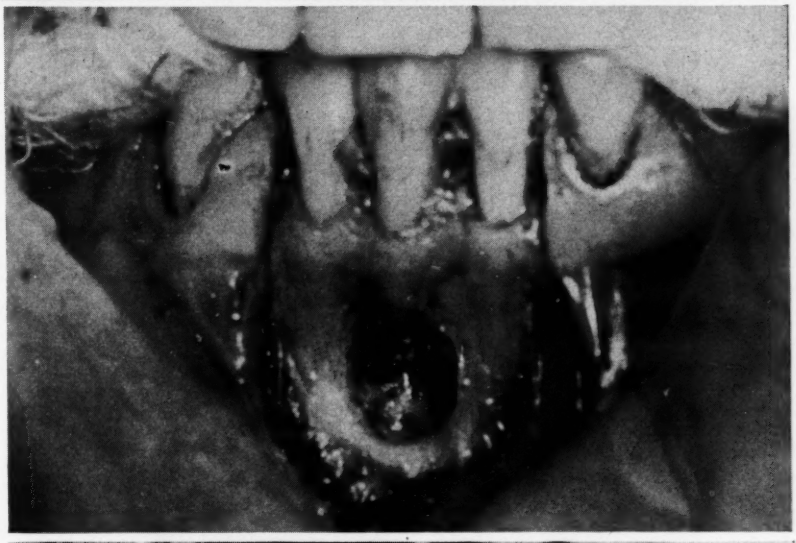


Fig. 8 (top, center)—Granuloma has been removed and apex is visible.

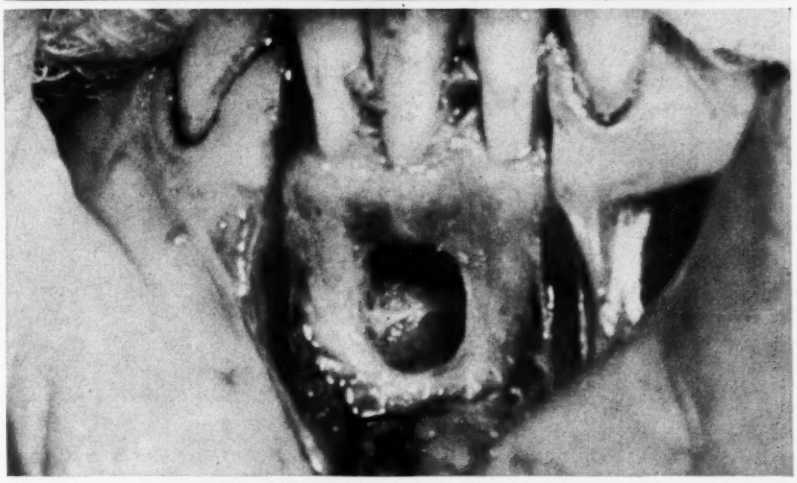


Fig. 9 (bottom, center)—Apex has been resected and bone cavity thoroughly curetted.

Fig. 10 (bottom)—This type of flap requires five sutures for proper readaptation and retention. One at top and one near bottom of each vertical incision and one at central gingival point. The last is accomplished by passing the catgut through the flap and ligating it around the tooth.

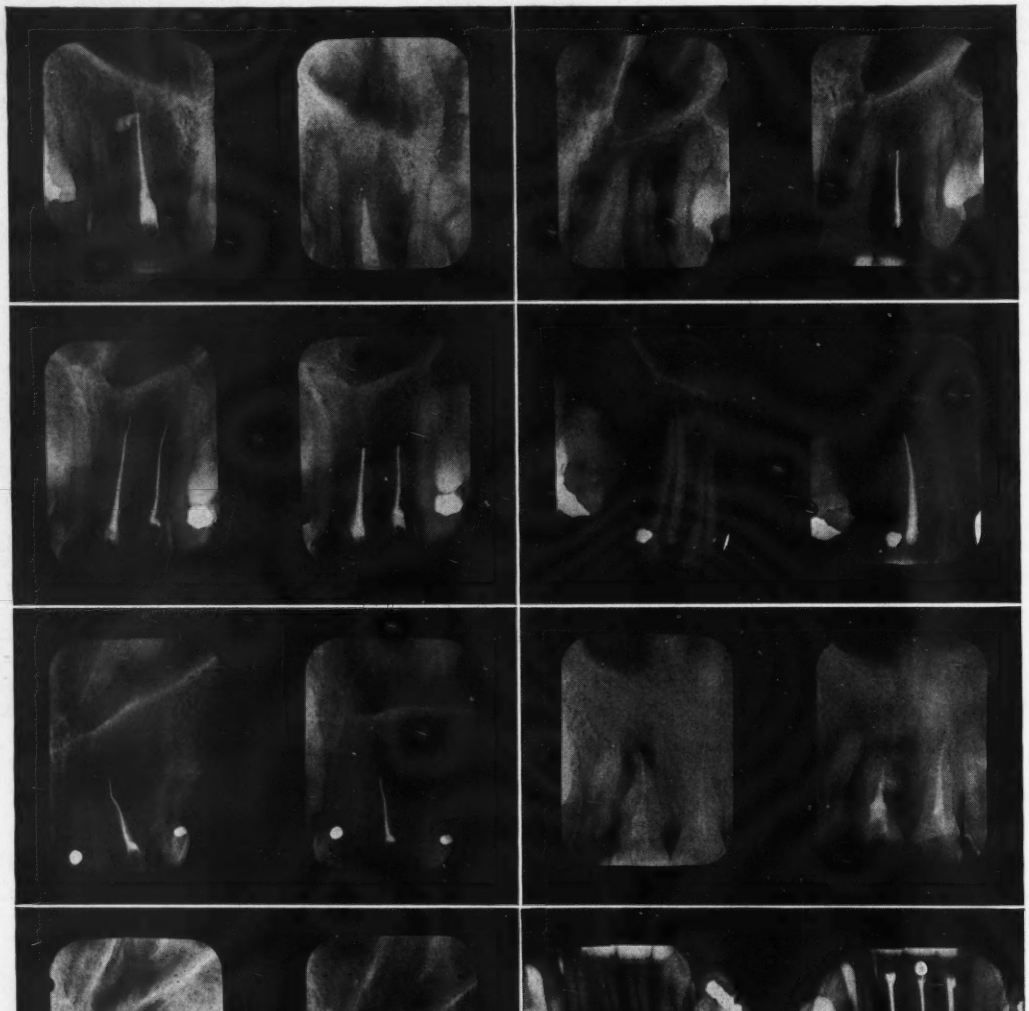
tween incision and the gingival border, its nutrition may become endangered. On the other hand, the incision should be low enough, so that after the window is made in the alveolar plate there will be a surface of bone between incision and the lower border of the window. This surface will later support the flap. To make this incision a Bard-Parker blade, number 11, is generally used (Fig. 1).

2. The flap is retracted (Fig. 2) with a periosteal elevator (Molt periosteum, Cleve-Dent, number 1). The location of the window is determined by a study of both roentgenogram and subject. There is usually a visible elevation of the alveolar plate as it conforms to the underlying root. The window is cut with a number 701 cross-cut fissure bur.

3. The circumscribed island of bone is pried out with a curet or a spoon-shaped excavator (Darby Perry, number 22). The apex is then visible (Fig. 3). The gutta-percha point extends considerably beyond the apex. It is purposely overfilled to insure a solid seal throughout the lumen of the canal.

4. The apex is resected with a number 701 cross-cut fissure bur (Fig. 4). The bone cavity is gently but thoroughly curetted. No granulomatous tissue should be allowed to remain. The curet must reach every nook of the bone cavity whether it extends palatally or laterally or along the root crown-wise. Thorough curettement is essential and cannot be overemphasized. This is done with curet 85 and 86 (Cleve-Dent).

5. Silver nitrate is applied to the cut surface of the root and is followed by the application of eugenol; thus the dentinal tubuli are sealed.



Figs. 11 through 18—Periapical conditions before and after apicoectomy. Figs. 15 and 18 show recent, incompleted cases with considerable regeneration already accomplished, however.

6. Bleeding within the bone cavity, if not already present, is stimulated by a slight curettement of its walls, and when the cavity is entirely filled with blood the flap is brought down into position and sutured.

Three sutures are usually necessary properly to retain the flap made by this type of incision: one at the center point and one near each end (Fig. 5). Catgut, number 000, is satisfactory for this purpose. A half-round number 14 needle is the needle of choice. The edge of the flap is supported by an underlying bone surface (Figs. 3 and 4).

The accompanying roentgenograms, showing periapical conditions before and after apicoectomy, substantiate the new concept regarding apicoectomy. Figs. 15 and 18 show recent, incompleted cases; the considerable regeneration already accomplished, however, demonstrates the soundness of this procedure even in extreme cases.

360 *Main Street.*

Additional Developments in the Use of Acrylic Restorations

LA MAR W. HARRIS, D.D.S., Chicago

DIGEST

In the June, 1940, issue a technique for acrylic restorations was described in detail. Improved steps in the technique are now reported, particularly with reference to the employment of copper-plated dies from modeling compound impressions.

THE WISH TO RESTORE teeth and supporting structures to a normal state of health and beauty is perhaps the essential motivating power in dental research. Usefulness, however, must certainly be given equal consideration. The field of research in acrylic restorations seems to offer more and more opportunities in this direction. Each tooth-color acrylic restoration promises a better one for the future. Those who have evidenced interest in this field will find a thrill of accomplishment in setting an inlay or jacket crown with perfect margins and perfect coloring.

Continued experimenting has yielded improvements in the technique. Although the technique remains essentially the same as described in the June, 1940 issue of The DENTAL DIGEST, the following steps have given better results:

Improved Steps in Technique

1. Prepare two copper-plated dies from modeling compound impressions, the first one being the impression taken from the patient's mouth. This impression is plated and run up in stone, the second impression being taken from this die. One die may then be used as a working model and permanent record: The other will be destroyed in processing the acrylic. For gingival inlays the modeling compound may be backed by a strip of copper.

2. The use of S. S. White's pure white cement may still be indicated for some small gingival inlays. In these cases the patterns taken with inlay wax are seated carefully in the zinc cement. The pulpal and axillary walls must be covered, with the cement extending just over the margins. The cement is then invested in the flask, as shown in Fig. 1, with a layer of tin foil between the cement and investment. It is important that no cement touch the investment as the chemical reaction between acid cement and basic plaster causes gas bubbles in the finished article. When the investment has set, the wax and top of the cement are covered with .002 foil and the other half of the flask is filled. The right view of Fig. 1 shows copper dies for inlays after they have been invested, boiled out, separated, and completely cleaned, ready for packing the acrylic. Either

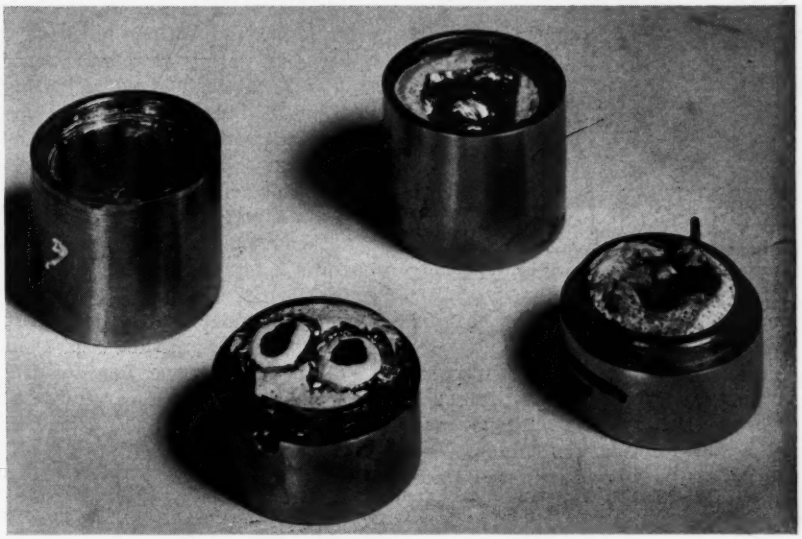


Fig. 1—Two methods of making gingival inlays.

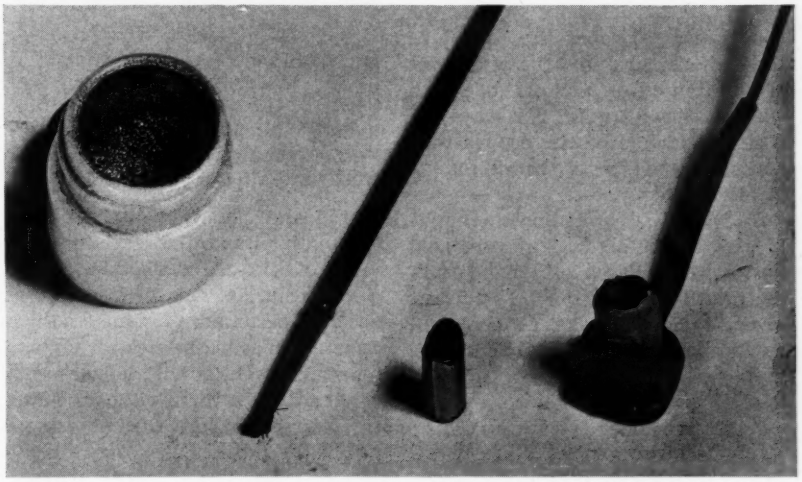


Fig. 2—Tube impression before and after mounting on cathode.

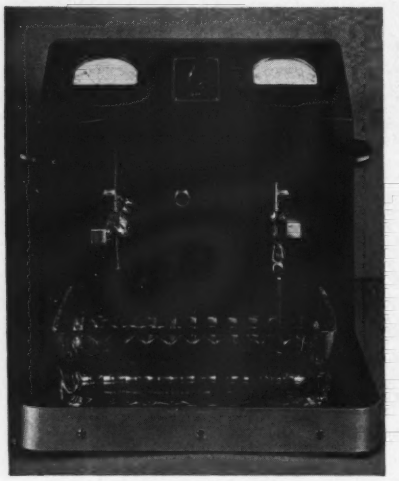


Fig. 3—Especially designed plating machine with volt and milliampere control. This particular machine is not commercially available.

cement or copper dies may be used successfully for inlays.

Electroplating is not a new process in dentistry and anyone not fully acquainted with the technique may gain full information through the library of the American Dental Association. A general idea of the process follows:

3. *Electroplating* — a) Mount the impression on the cathode, making certain that at least one point of the copper band touches the copper of the cathode. Surround the remainder of the impression and cathode with wax, as shown in Fig. 2. Always expose a fine line of the copper tube above the shoulder of the impression at one or more points.

b) Wash the impression thoroughly with a saturated solution of gold dust in water. Brush lightly and sparingly with three-in-one oil and dust on the bronzing powder. (Commercial bronze powder may be used if it is first washed thoroughly with acetone.)

c) Wash under running water; place copper sulphate solution on with eye-dropper, leaving one drop on, or in, the impression.

d) Dust on control powder and with additional solution in eye-dropper, wash the control powder until a clear solution returns to the dropper.

e) Turn on the current in the plating machine and place the cathode on the holder. The plating is most successful when begun at one-half volt and lowered to three tenths of a volt when plating gets well under way. In a battery-controlled plating machine with both volt and milliampere meters for accuracy (Fig. 3) the plating can be completed in one-half to one hour depending on the thickness of the plate desired.

f) Remove plated impression from machine before turning off the current.

g) Wash under the tap and pour stone into the impression (Fig. 4).

h) When the stone has set the modeling compound is carefully removed and a perfect duplication of the tooth preparation remains, provided, of course, that the tube impression is accurate. This die can have an absolute minimum of change as it is a metal deposited by electrolysis, and inasmuch as the acrylic may be pressed directly to it there will not be even the discrepancy of a thickness of tin foil in the finished jacket or inlay.

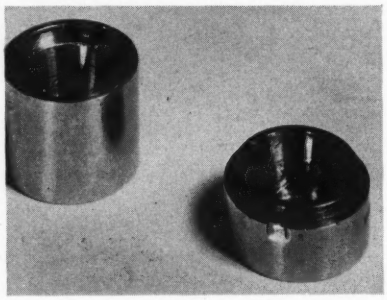


Fig. 5—Correctly designed flask to maintain compression.

4. *Investing*—The wax pattern, carved in the desired shape of the restoration, is placed on the die which is then invested in the flask. Fig. 5 shows the recently developed flask which is designed to take care of the 2 mm. safety shut-off necessary for proper compression. The pattern for the restoration is carefully tin-foiled, the upper half of the flask filled, and enough pressure maintained during the setting time of the investment to keep both halves of the flask together.

5. *Adding Color and Packing*—After boiling, separating, and thoroughly cleaning the wax from both sides of the flask, mix the colors of powder to be used and pack to an excess, either in the negative of the

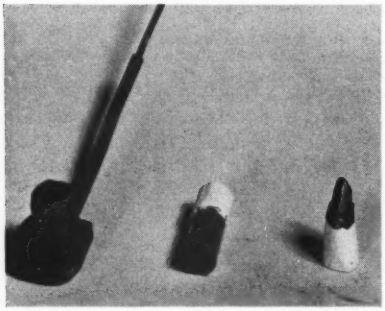


Fig. 4—Copper tube impression after plating; stone die run and separated.

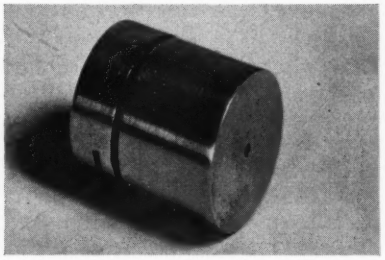


Fig. 6—Flask ready for glycerin. Packed and closed within 2 mm.

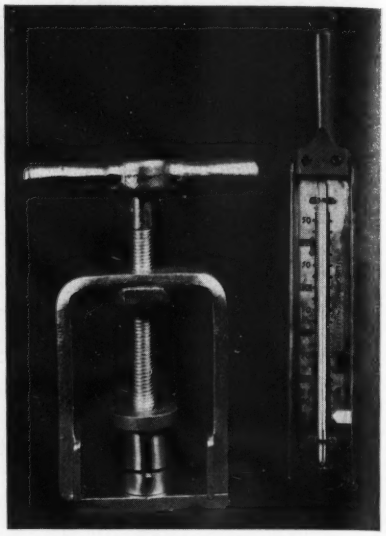


Fig. 7—Flask, press, and thermometer at start of processing.

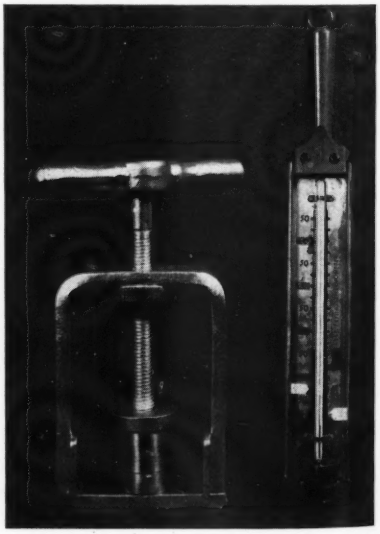


Fig. 8—Flask, press, and thermometer after half hour's processing.

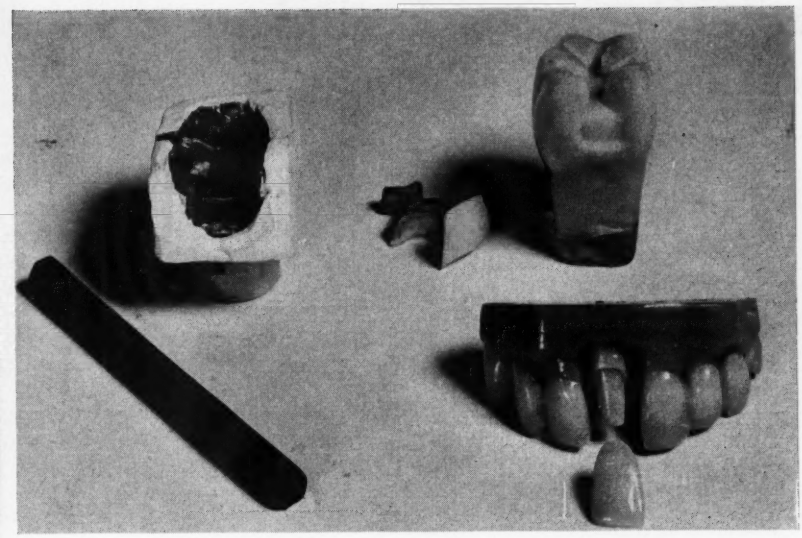


Fig. 9—Types of restorations showing versatility of acrylic.

crown, or the die half of the inlays.

6. *Flask in Press and Immersed in Bath*—Close the flask to within 2 mm. (Fig. 6); place in the press and into the glycerin bath. Fig. 7 shows the flask in the press with the thermometer indicating 125° F., at which temperature the flask is immersed in the bath. Fig. 8 shows the press with the flask completely closed when the thermometer indicates 175° F. Thirty minutes must elapse between these two temperatures. When the flask is completely closed the temperature may rise rapidly to 245° F., where it should remain for another thirty minutes. The press may then be removed and the flask cooled immediately if desired: however, when possible the temperature is allowed to drop about 50° while the flask is still in the glycerin.

7. *Removing Copper and Cement from Acrylic*—When the restoration is removed from the flask the copper will adhere to the acrylic, as will the cement, and either may be removed by placing the restoration into a warm solution of dilute hydrochloric acid which will loosen the copper and make it easier to peel off. The acid will also disintegrate the cement.

8. *Setting* — Inlays and jackets should be set with kryptex, which comes in sufficient variety of shades to make it possible either to match the restoration or to give a complementary shade when it will more nearly duplicate surrounding teeth.

Comments

The versatility of the acrylic is indicated by Fig. 9, which shows an enlarged model of a tooth made of acrylic (three shades) with the accompanying inlay and copper die in which it was made. The acrylic model and jacket, also in three shades, are exact reproductions of an actual case.

The original glaze, or polish, given the acrylic restorations that have been placed so far show no signs of scratching or etching after one year's practical use. The gum tissue takes more kindly to the acrylic as time goes on, thus eliminating the problem of gingival irritation.

Two-surface molar inlays have not been in use long enough to indicate exactly what reaction they will give to attrition, but so far they show no signs of wear. Gingival inlays, and tooth-color facings for gold crowns are two practical uses to which the acrylic may well be placed. A facing pressed into the veneer gold crown cannot be broken or forced out in mastication. Jacket crowns are ideal restorations for which to use acrylic.

The colored powders as well as the necessary equipment are now available through regular supply sources.

25 *East Washington Street.*

Announcement of Books Received

PROCEEDINGS: DENTAL CENTENARY CELEBRATION, sponsored by Maryland State Dental Association and American Dental Association, Edited by George M. Anderson, Baltimore, 1940.

TEXTBOOK OF DENTAL ANATOMY AND PHYSIOLOGY (394 Illustrations), By Russell C. Wheeler, D.D.S., Philadelphia, W. B. Saunders Company, 1940.

VITAMINS: What They Are and How They Can Benefit You, by Henry Borsook, Ph.D., M.B., New York, The Viking Press, 1940. Price: $2.00.

FOOD, TEETH AND LARCENY, By Charles A. Levinson, D.M.D., New York, Greenberg: Publisher, 1940. Price: $3.00.

Full Denture Rebasing Technique

JEROME M. SCHWEITZER, D.D.S., New York

DIGEST

An alternative technique is suggested for full denture rebasing *without* changing the vertical dimension or *with* changing the vertical dimension.

Rebasing Without Changing the Vertical Dimension

1. File away as much as possible of the inside surface of the old denture, particularly the hard palatal areas that need to be relieved (Fig. 1).

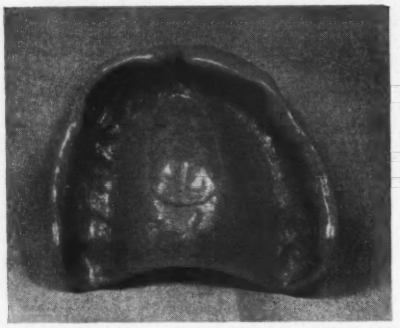


Fig. 1—Inside of denture is thoroughly dried.

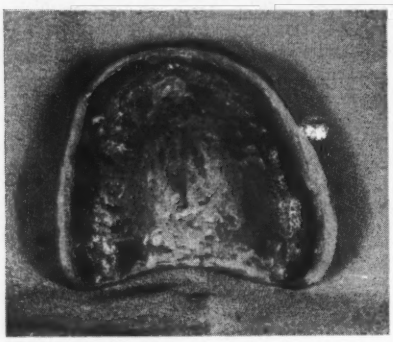


Fig. 2—Undercut beneath lip is cut away from denture. If this were not done, it would prevent denture from going into its farthest posterior position.

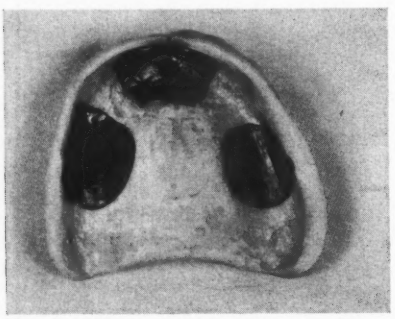


Fig. 3—About an inch of hot modeling compound is added in bicuspid and first molar ridge areas on both sides and in anterior region. *This is only if vertical dimension has to be increased.* Denture is inserted while the compound is still soft, and patient is instructed to close gently. An upward, backward pressure is exerted in anterior region with fingers, while patient is closing. This prevents denture from slipping forward.

2. File away 2 mm. or 3 mm. from the peripheral margins all around (Fig. 2).

3. With a stick of modeling compound, start to build from the right heel forward to the first bicuspid area (Fig. 4).

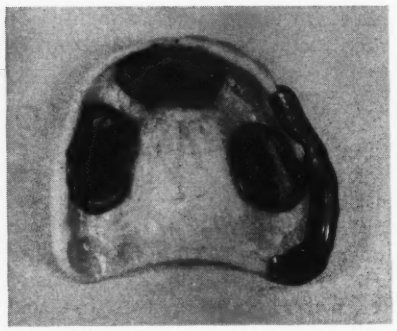


Fig. 4—Denture is muscle-trimmed, starting at right heel and proceeding to right cuspid.

4. Add the compound to the dry periphery and then use a torch or a good flame to soften the compound; with moist fingers mold the compound into approximately the desired shape.

5. While warm, replace plate in the mouth and have the patient close his teeth and go through the motions of whistling and grinning to muscle-trim. Chill the compound, and remove. If the border is rough and uneven, or shy, rewarm the compound and repeat this step until the impression is correct.

6. The same procedure is repeated on the left side, starting at the left heel and going forward to the left first bicuspid area (Fig. 5). Again, be sure that the muscle-trim is correct.

7. On the right side, trace the modeling compound forward from the right first bicuspid area to the median line. When the compound is soft, replace the plate in the mouth and mold it with the fingers, being sure to relieve the muscle attachments.

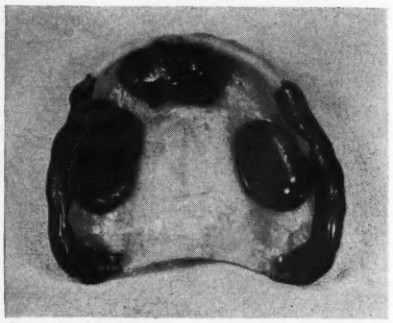


Fig. 5—Modeling compound is run from left heel to left cuspid.

8. The same procedure is followed on the left side from the left first bicuspid area forward to the median line where it joins the modeling compound from the right side to form an anterior seal (Fig. 6).

Fig. 6—Modeling compound is traced from right first bicuspid area to median line and from left first bicuspid area to median line, so that an anterior seal is formed.

9. Postdamming is now done. With a stick of green compound (Kerr),

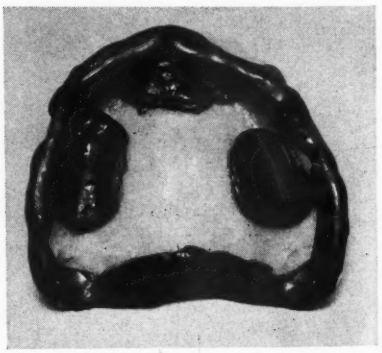


Fig. 7—Posterior postdam is traced from right to left tuberosity.

trace along the entire posterior border from right to left tuberosity. It has a lower melting point. Make sure it is soft; then introduce the denture into the mouth. The compound should extend the slightest distance on the soft palate. Chill the compound and remove (Fig. 7).

10. By this time, the denture should have fairly good suction. If, on examining the posterior border, it is found that the compound has spilled over the edge under pressure, it is correct; otherwise, add to the compound and apply pressure again until the compound spills over the entire border. The entire peripheral seal has now been developed and muscle-trimmed.

11. With a large round bur, perforate the center of the palate in several places (Fig. 8), particularly near the hard areas. The idea is to relieve the hard areas wherever possible to prevent rocking and to have as much pressure on the ridge areas as possible.

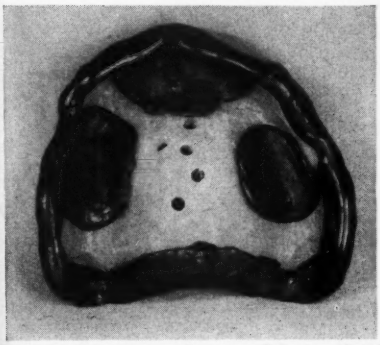


Fig. 8—By means of a round bur, palatal portion is perforated over areas that are to be relieved.

12. Dry the denture and have the relining or wash material ready. Any suitable material can be used which is simple to apply, gives sufficient working time, and sets fairly rapidly. Paint the entire inner surface of the denture with this material.

13. Try the denture in the mouth. Be sure that the occlusion is correct. Often the denture is too far forward and must be pressed upward and backward. The articulation with the lower teeth should be noted, and if correct, the patient should go through the muscle-trim movements.

14. Mold the anterior portion with the fingers, and when the material has set, remove the denture (Figs. 9 and 10).

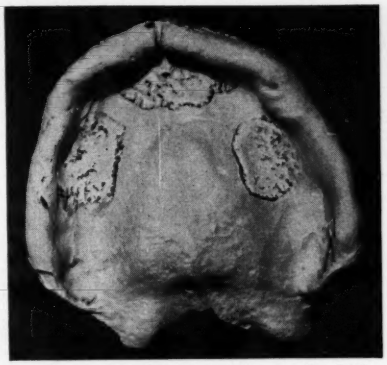


Fig. 9—An impression is taken under biting pressure.

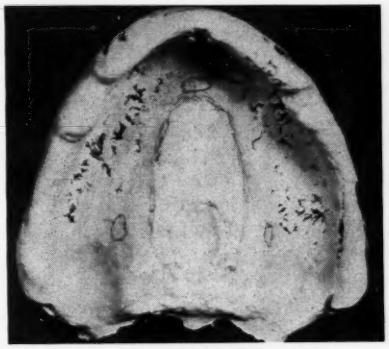


Fig. 10—Impression of a different case.

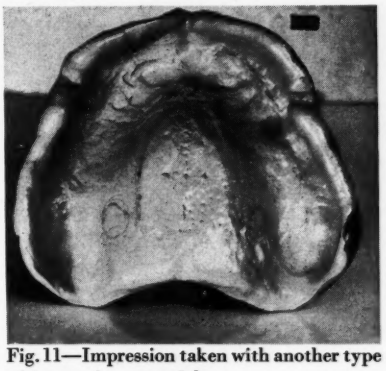


Fig. 11—Impression taken with another type of impression material.

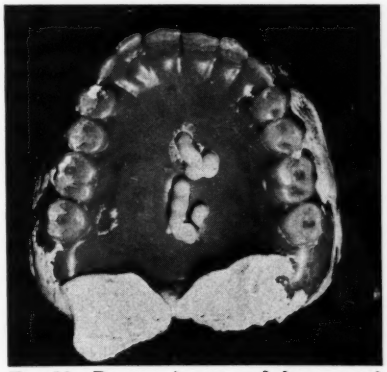


Fig. 12—Denture is removed from mouth after material has set.

The rebasing procedure is completed (Fig. 11). Finishing the denture is all that remains to be done.

Rebasing With Changing the Vertical Dimension

The only difference between this method and the preceding one is in the initial step:

1. If the vertical dimension is to be increased, then the anterior border, which is usually somewhat undercut (Fig. 1) will have to have this undercut removed or it will not allow the denture to go to its farthest posterior position.

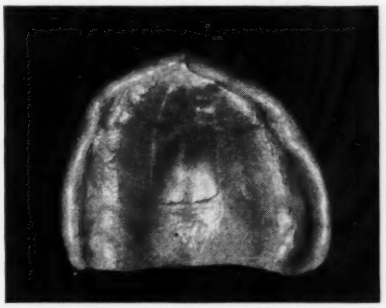


Fig. 13—New denture is finished from a model made from this impression.

2. Together with the other relieving, be sure to eliminate the anterior undercut (Fig. 2).

3. Heat three small pieces of modeling compound about the size of a lima bean.

4. Place one on the under-surface of the denture directly beneath the right first bicuspid area in the center of the ridge; one in the opposite bicuspid area on the left side, and the third, directly in the center of the anterior ridge area (Fig. 3). Apply these three pieces of modeling compound while the denture is dry.

5. Introduce the denture into the mouth and have the patient gradually close his teeth. It is necessary to guide the denture, making sure it is far enough posteriorly so as not to destroy an existing good bite. When the vertical dimension is correct, have the patient stop closing the bite, and chill the modeling compound. These three pieces prevent the denture from closing any farther.

6. From this point on, the rebase is carried on in exactly the same manner as previously described. The only exception is that in the finished denture, the bite will be opened to the degree decided on when rebasing was begun.

730 *Fifth Avenue.*

The Fixed-Bar Removable Bridge

C. W. JACKMAN, D.D.S., Chicago

DIGEST

A technique is offered in which the desirable features of both the fixed and removable bridge are incorporated in a single dental unit consisting of a fixed bar attached to abutments and a removable block. The fixed-bar removable bridge, the author suggests, may be used with greater advantage wherever an ordinary fixed bridge may be employed.

THE MECHANICAL SHORTCOMINGS of most partial dentures may be traced directly to ignoring the laws of physics and biology. Dentistry has placed the three phases of dental engineering in the following order of importance: mechanics, 60 per cent; physics, 30 per cent; biology, 10 per cent. In studying the problems pertaining to oral reconstructions, it is my belief that the order of importance should be exactly reversed. A great deal has recently been written in support of this contention, and such statements[1] as the following are now frequently read:

"The restoration of edentulous spaces by means of fixed bridges, by ardent and almost universal application of mechanical principles to the restoration of mouth tissues, with a lack of consideration for the biologic, physiologic and hygienic requirements of the case, is now regarded as an outstanding error in prosthetic practice, recognition of which has brought about a readjustment of these mechanized procedures which often resulted in pathologic conditions."

The purpose of the fixed-bar removable bridge to be described here is to incorporate in one dental unit all the desirable features of the known fixed and removable dentures, and at the same time to eliminate in so far as possible the harmful aspects.

[1]Klaffenbach, A. O.: Some Important Aspects of Fixed Bridge Restorations, J. A. D. A. 27:378 (May) 1940.

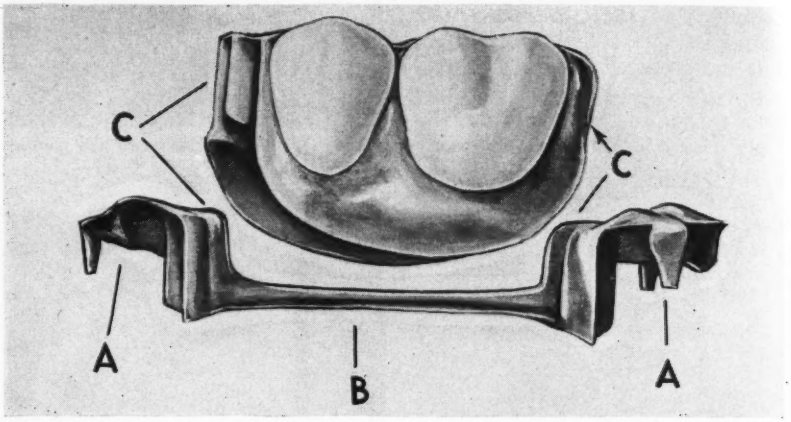


Fig. 1—A, Inlays; B, bar; C, attachment.

Technique

The fixed-bar removable bridge consists of two parts: the fixed bar attached to abutments, and the removable block (Fig. 1).

The Fixed-Bar—A rounded bar of the finest clasp-gold metal, from 14 to 18 gauge, is cast with the inlays or crowns for the abutment teeth. When this unit, consisting of the bar and inlays or crowns, is in place in the mouth, it makes no contact with living tissues (Fig. 3, A). A simple attachment is placed at each end of the bar, and serves to hold the removable block absolutely firm under every stress of mastication (Fig. 3, B).

The abutment preparations (Fig. 3) are made correctly according to rules of physics and mechanics and provide for the minimum of stress on the tooth, gum tissue, and jaw structure. In such an immovable construction, the abutment teeth and supporting tissue form a single unit with the bar and inlays, or other abutment construction. This is not, strictly speaking, true in construction of movable contacts, such as in the use of clasps or any of the types of attachments that were and are used to retain removable restorations where there is no definite retention between the abutment teeth.

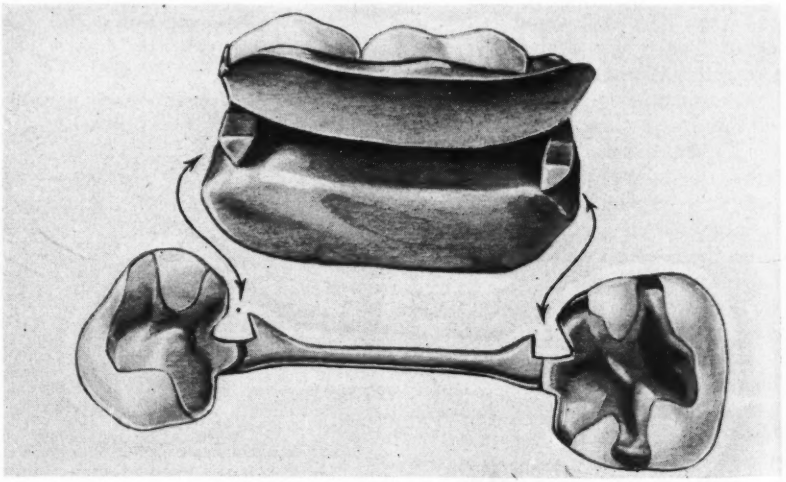


Fig. 2—Occlusal view of bar showing surface of block that saddles gum. Note shape of clasps that hold pieces together.

In the fixed-bar removable bridge the attachment is incorporated in both the abutment and the bar and serves not only to insure stability to the removable section but also to protect the tooth structure from injury by the removable block.

The attachment has a vertical projection toward the space occupied by the removable section. All vertical surfaces of the attachment are on the same plane. This provides a definite check on any tendency to move. The attachment pins on the removable part fit a vertical V-shaped groove, and tension to provide firmness of position can be increased as desired. This attachment can be seen in Fig. 1, C.

The Removable Block—This block is cast in one piece and is so designed as to have its entire weight placed on the fixed bar. Even in the strongest bite, no pressure is exerted on the soft tissues. Because it is securely fastened to the fixed bar, this block, although removable, is prevented from accidental slipping.

Owing to the peculiar construction of the removable block, the operator can compensate for the anatomic loss to a greater degree than he can in any other type of reconstruction, and thereby achieve the finest esthetic results. The difficulties encountered in setting the pontics in labial or buccal alignment in fixed construction are overcome.

When facings are used, they are selected to compare with the remaining teeth, and a uniform gingival margin is attainable as well as perfect labial and buccal alignment.

This bridge can be used wherever an ordinary fixed bridge is indicated. If a saddle is required on the same jaw with the fixed-bar removable bridge, a lingual or palatal construction can unite the saddle with the removable part of this bridge. In such instances, the use of such a unit is advantageous. In cases in which two or more fixed-bar removable bridges are constructed for the same jaw, the removable sections can, if desired, be connected. By doing so the degree of resistance to the lateral and torque forces is even greater than when each bridge is treated as a unit.

In the fixed type of construction, the forces follow through the long axis of the abutment teeth. This is not the case when the removable type of bridges are used because here the forces contact the periphery of the tooth crown.

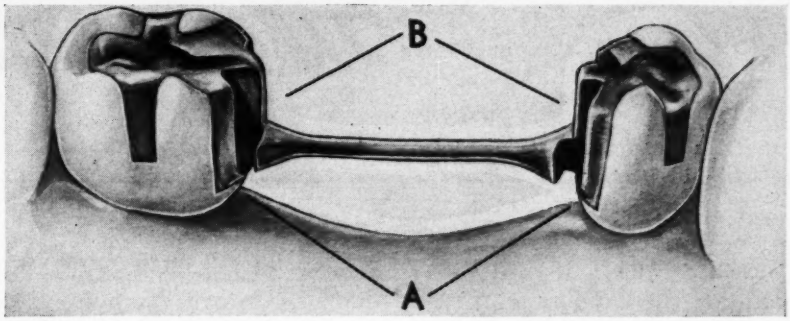
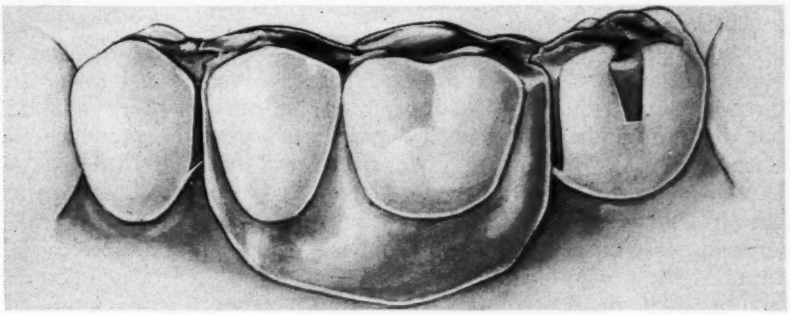
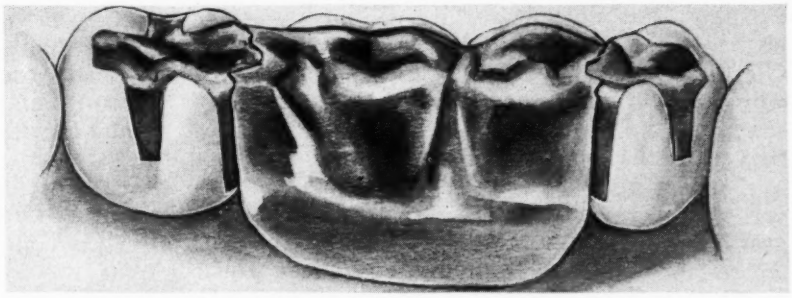


Fig. 3—Fixed bar in place, lingual view. Note freedom from gum contact, A, and attachments, B.





Figs. 4 (center) and 5—Fixed-bar removable bridge in place on jaw shown from buccal and lingual sides respectively.

1. From every angle, I sincerely believe that this bridge contains all the best features of the fixed and removable types of restorations now in use and, in addition, its lasting firmness of position gives the wearer a feeling of confidence.

2. The lingual, buccal, and labial surfaces preserve the natural contour and enable the tongue, cheek and lips to give their maximum service in speech and mastication.

3. Normal oral sanitation is in no way impeded by the use of this bridge, inasmuch as the removable section can be easily taken out for daily cleansing, and the fixed section is completely free from soft tissues.

4. This easy removability of the block also permits the wearer to take the bridge out at night, if desired, so that the abutments may be relieved of the weight during the night, with the assurance that, no matter how long the block is out of the mouth, the abutments will be kept in perfect alignment.

5. This bridge may and preferably should begin its long service before the extraction of the diseased teeth, by constructing the fixed part so that it can be inserted immediately after extraction. By doing this, the remaining teeth will be kept in their proper alignment, lameness of the abutments will be prevented, and the sockets will be protected. This fixed bar can be worn without cementing until healing has progressed far enough to warrant insertion of the removable section.

108 *North State Street.*

The Editor's Page

BEFORE APRIL FIRST, 1941, present plans call for the induction of 3,000 dentists, into the Dental Corps of the Army. As the vast conscription program gets under way, it is estimated that there will be at its maximum intensity, 15,000 dentists who will have received military training. The implications of this program are extensive and ramified. The output from all the dental schools in the country for the immediate years ahead could easily be absorbed into the military service and still there would be a scarcity of dentists to meet the military demands. With death and retirement striking the civilian-dentist population, without replacements from the dental schools into the civilian ranks, it is easy to see what may happen to private dental practice.

Compulsory military service will increase the health consciousness of the American people. Glaring physical inadequacies and diseases will be revealed. The government, to be consistent, can do only one thing—plan to prevent such physical incapacities from appearing in the next generation of soldiers. From this awakening will arise a country-wide program for the protection of the health of the American children. It is unlikely that this program will be merely one of education and exhortation; it is unlikely to be one to function under the economic philosophy of laissez-faire in private practice. That this will be a well considered program has already been forecast in the President's speech when he said in dedicating the National Institute of Health at Bethesda, Maryland: "The total defense that we have heard so much about of late, which this Nation seeks involves a great deal more than building airplanes, ships, guns and bombs. We cannot be a strong Nation unless we are a healthy Nation. And so we must recruit not only men and materials but also knowledge and science in the service of national strength."

The government, seeing the terrific economic loss from ill health, will likely institute a health program for children which will require treatment of defects as well as health education. Such a program for the dental health of children is entirely consistent with the National Health Program as sponsored by the American Dental Association.

Let us imagine a program wherein, for example, 3,000 other dentists in the country would begin to provide care under the child health provisions of the present Social Security Act. This is entirely a conjecture but one worth considering. With these 3,000 dentists in addition to the 15,000 who will be called to service under the compulsory training act, there would be a total of 18,000 dentists or somewhat more than 25 per cent of the total dental population of the United States engaged in government service. As more and more young people are attracted into government careers and as more children and young adults have become conditioned to receiving health care from their government, a situation will be created over the years in which the majority of people will have known government care at first-hand and the majority of dentists will have contributed their years and efforts to work under government supervision. In about twenty years there will be so many dentists who will have done government work that the entire attitude of the profession toward so-called state medicine will no doubt have changed completely. It will no longer be the terror by which it is viewed by the stout individualists.

We had feared before the impact of the present war that state medicine or health insurance might be borrowed in toto from European countries and engrafted upon American life as an expansion of social security legislation. We were looking for something sudden. What we find now, however, is that we are being pushed from an entirely different direction into state medicine—not by legislation to create social security but by the legislation to improve the national defense. We call this kind of state medicine by another name: military preparedness. No matter what it is called, it means that the government itself has taken over and will take over to a greater extent the health care of all the people.

The laments of "back to normalcy" and "back to the good old days" are futile utterances. We can no more expect the old days of economic life, including the old-time affairs in the practice of dentistry, than we can expect to return to ox-carts, candles, and fuel oil lamps.

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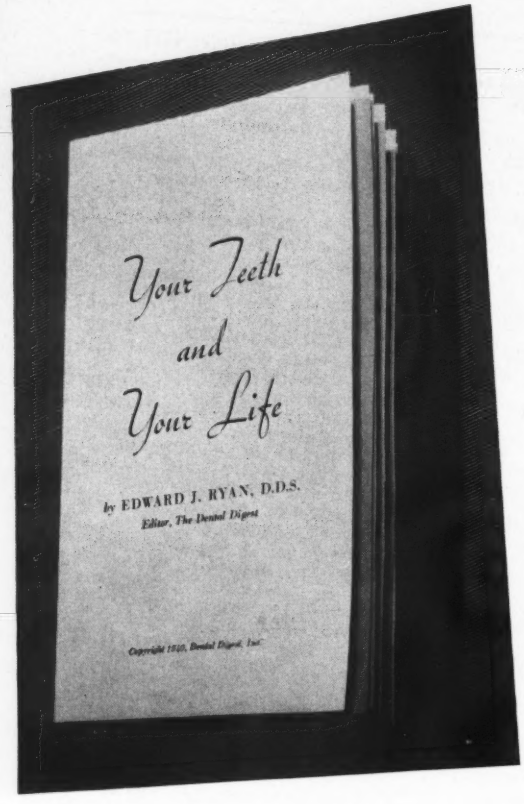
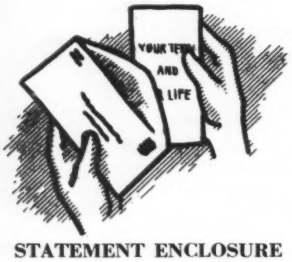


Orders for 15,000 copies received from our announcement of this booklet in the November issue. Did you order copies yourself?

You'll find this booklet a distinct help in your educational program. Use convenient order blank on opposite page, please.

SOME SUGGESTED USES



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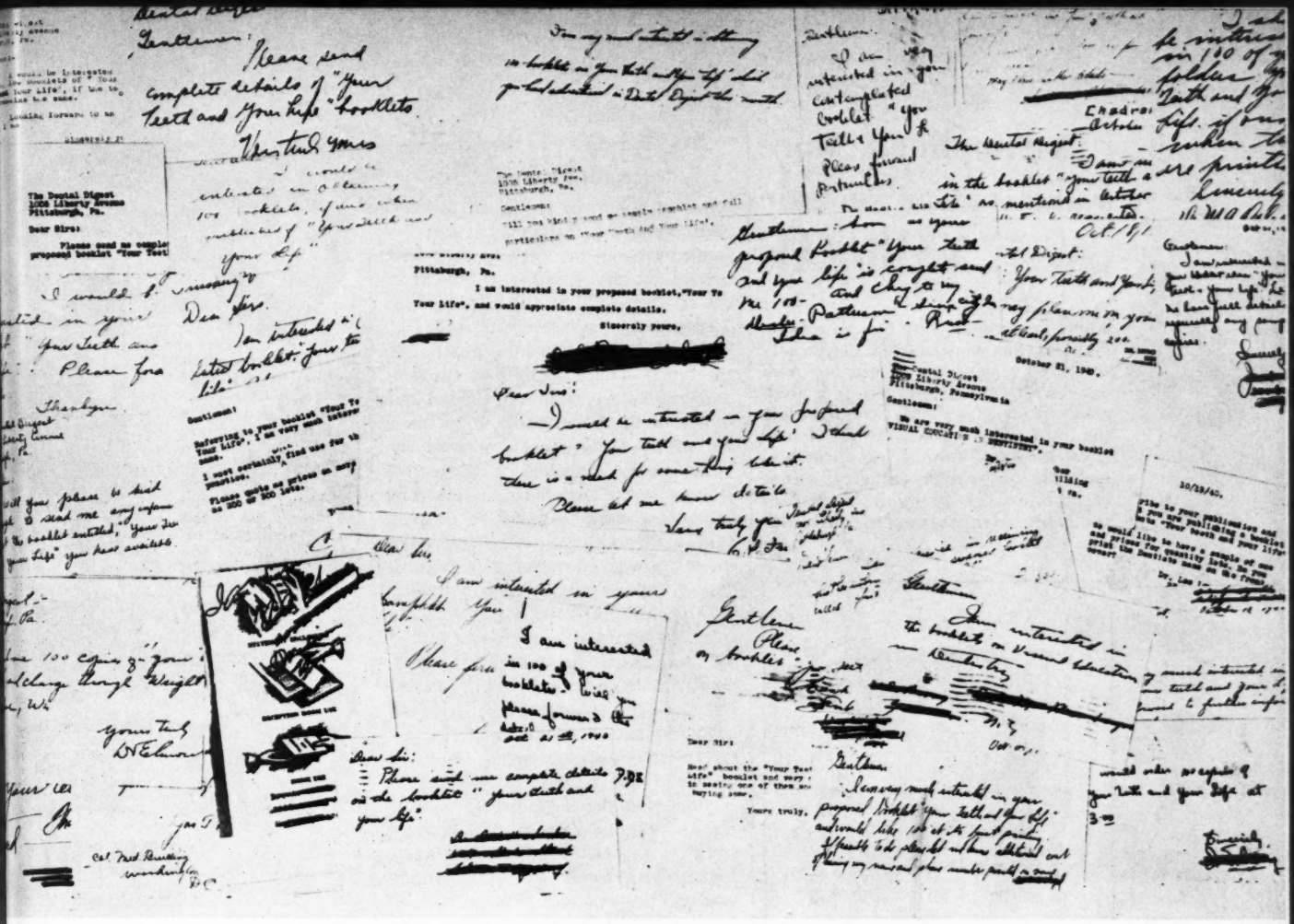
HOME USE



This illustration shows only a few of the many enthusiastic letters we received shortly after we announced the booklet, YOUR TEETH AND YOUR LIFE.

Practitioners everywhere were not long in realizing the tremendous value of the booklet YOUR TEETH and YOUR LIFE. Orders are being received every day and the unsolicited comments have justified our confidence in the fact that this is the type of booklet dentists have been looking for for patient distribution.

Patient-education is an important factor in any dental practice. An *understanding* patient is a *better* patient—one who realizes the value of proper dental care, and the dangers of neglect.

To this end YOUR TEETH AND YOUR LIFE is a *powerful* but *ethical* means of educating the dental patient. The story incorporated with the charts is one that drives home the value of proper dental care—*and the dangers of neglect*. The charts tell a complete story in a simple manner and serve as a reminder that regular dental treatment is important to good health.

There are many ways YOUR TEETH AND YOUR LIFE can be used in *your* practice: (1) as a statement enclosure; (2) for reception room use—patients can read the booklet while awaiting dental treatment (reading time 5 to 10 minutes); (3) for patient distribution upon dismissal; (4) for dental societies and Parent-Teacher Association groups. The booklet can be used indefinitely for the above purposes. Perhaps you will think of other ethical uses.

Because of printing a very large quantity we are able to offer this booklet to you at relatively low prices. 25 cost only $1.00. For 100 the price is $3.00. Surely *you*, too, can put YOUR TEETH AND YOUR LIFE to immediate use in your practice. Your order will have prompt attention.

The coupon below is for your convenience in ordering NOW. Fill it in and enclose it with your remittance and it will be only a matter of a few days before you'll have this valuable material for patient distribution. IF YOU HAVEN'T USED THE POSTAGE PAID ENVELOPE ATTACHED TO PAGE 393 IN THE *NOVEMBER* ISSUE WE SUGGEST YOU USE IT. It requires no return postage.

THE DENTAL DIGEST, 1005 Liberty Ave., Pittsburgh, Pa.

Here is $————covering copies of YOUR TEETH AND YOUR LIFE. Quantity is marked in box at right.

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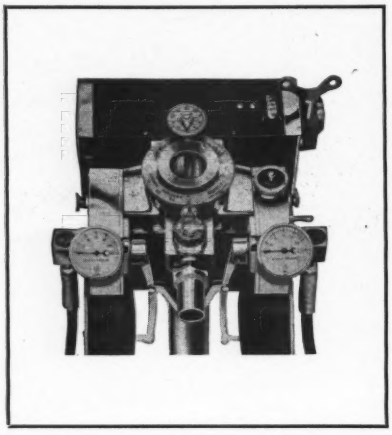

★ *Easier Gas Administration*—The Nargraf actually adjusts itself to the patient's respiration. The intermittent flow principle coordinates the flow of gas with the rate at which the patient breathes, thus relieving the operator of the necessity of adjusting the flow rate with every change.

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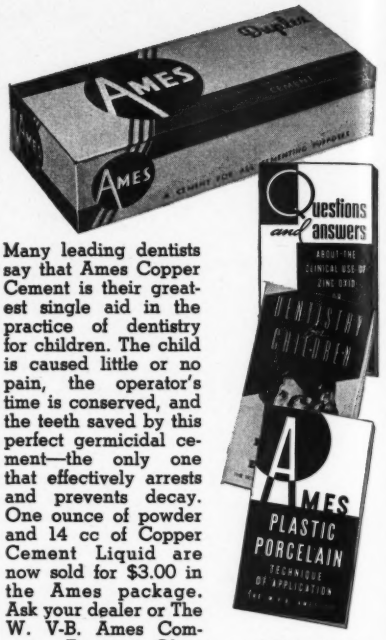
NOTES ON THE CUFF

(*Continued from page* 414)

miles of them, in the farm truck, I kept repeating the refrain that my family sang in my ears as they sent me off on my errand: "Remember, it's a drop-leaf kitchen table that you're going for, asking price, $3.00."

Looking neither to the right nor to the left, I strode firmly into the second-hand store, resolutely passed cylinders of linoleum, through tortuous barricades of bedsteads, onward beyond newly polished batteries of stoves—to the anticipatory clerk. The table the clerk showed me was a squeamish green job and the legs were unsteady with the years of servitude. Three dollars would be two dollars too much. The clerk didn't like my offer. As I turned to go, I was halted by the sight of an old roll-top desk, comfortable under its shawl of dust. I liked the ink splashings on the dark oak, the faded sticker announcing, "COOPER Wagons, Buggies, Bobs and Cutters," the receipt in small part payment on the large grocery bill of some ravenous family. Then there were the intimate signs of mice nestings in the drawers; but what sold me was the professional card of "Mr. A. Green, Justice of the Peace." Here was a desk that had seen life. It was the Bar and Bench: before it had been tried the principals in rural feuds. It was the altar and the parsonage: before it had stood young and old, men and women, as they gave the marriage vows, repeating after Mr. Green. The asking price was $10.00, but as business was bad and I had my own cartage the price was $8.00 cash. One good turn deserves another, so I said, "I'll just look around and buy something else to make the deal an even ten dollars." I felt magnanimous.

I didn't need anything, but how about a chair? There was a spreading leather one, like a grandmother's lap, but the springs were ready to strike through at vulnerable loci. I didn't care for linoleum with coffee spillings in geographical designs and I didn't want lamps with marble bases. Hanging high over a stack of honeymoon pillows with "Niagara Falls," "World's Fair Souvenir," " 'Frisco," embossed upon them, was a lamp—a railroad station lamp. You've seen them at country stations, holding the light of a friendly lantern. They call them hurricane lights



Many leading dentists say that Ames Copper Cement is their greatest single aid in the practice of dentistry for children. The child is caused little or no pain, the operator's time is conserved, and the teeth saved by this perfect germicidal cement—the only one that effectively arrests and prevents decay. One ounce of powder and 14 cc of Copper Cement Liquid are now sold for $3.00 in the Ames package. Ask your dealer or The W. V-B. Ames Company, Fremont, Ohio.

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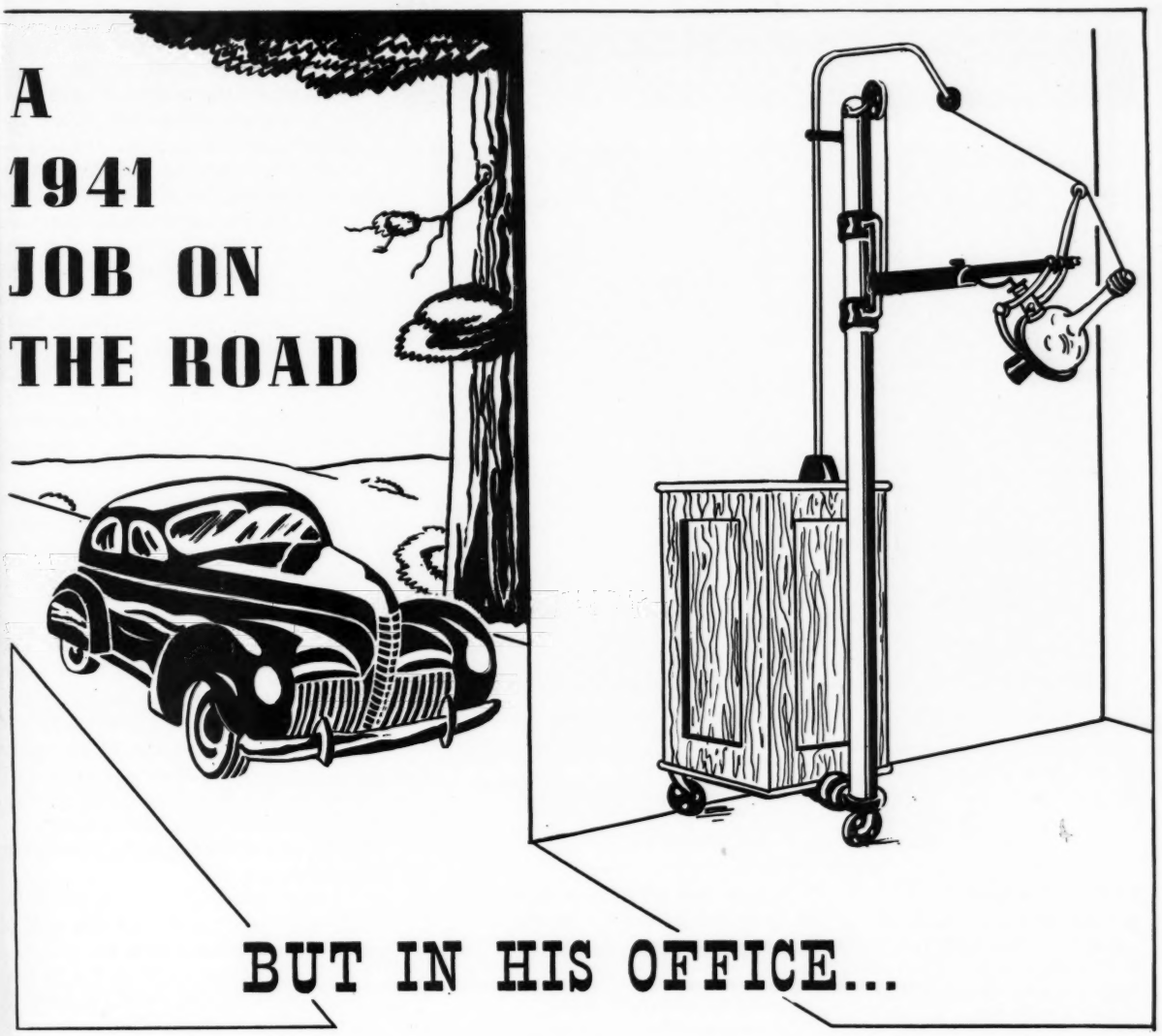

BUT IN HIS OFFICE...

Isn't there something a little ironical in the annual custom indulged in by some dentists of habitually turning in new cars for somewhat newer ones, yet continuing to "drive" their x-ray units until they fall apart?

Fun is fun, yes; but, after all, business is business. And one of the best ways we know of to improve a dentist's practice is replacement of wornout or obsolete x-ray apparatus with a modern, efficient, dental x-ray unit such as the CDX.

As you well know, patients—especially prospective ones—are all too easily impressed with visible signs of progressiveness. And, while they may never see their dentist's new car, they can't fail to notice an ageing x-ray machine.

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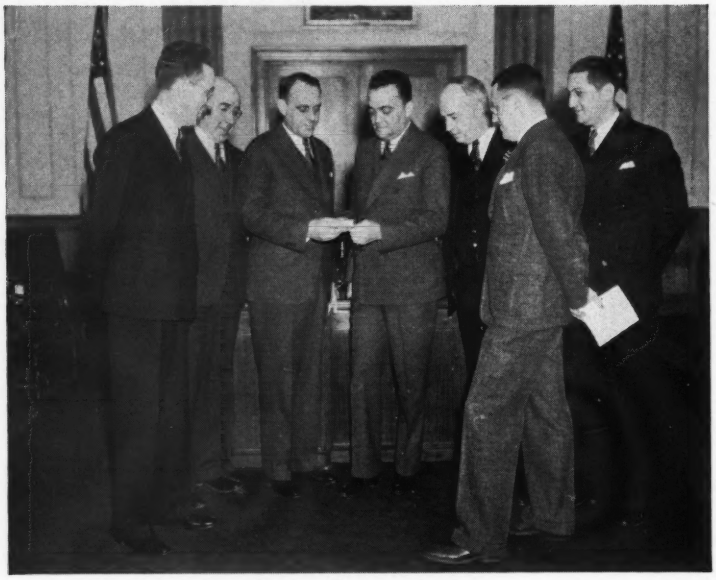

Members of the District of Columbia Dental Society visit the office of the Director of the Federal Bureau of Investigation. Left to right: J. P. Burke, C. W. Camalier, S. C. Hopkins, Director J. Edgar Hoover, G. Albert Smith, M. A. Goldberg, and Walter A. Rath.

HELP! HELP!

HELP YOURSELF

In December's leading article, "Asleep to Our Opportunities," Dr. F. C. Runge says, "I am convinced that we can multiply our volume many times over by careful and thorough examinations and properly presented advice." Perhaps his methods will help you as they have helped him. (p. 1481)

HELP THE G-MEN

The G-Men will welcome your help. "The FBI Discusses Dental Identification" tells how dentists can aid in the scientific detection of crime. (p. 1504)

HELP WHEN YOU RETIRE

In "The Dentist's Quest for Old Age Security," another in ORAL HYGIENE's series, Margaret W. Wagner discusses help for retired dentists. (p. 1487)

HELPING PATIENTS—AND YOURSELF

Dr. M. M. Lumbattis tells how "Regular Dental Service Saves Money," and cites actual figures from his own practice. (p. 1492)

HOW HOBBIES HELP

—help relieve tension created by hours at the chair. Dr. S. A. Allen tells how Dr. L. R. Sattler rides hobbies—in "Dentist-Rancher Experiments with California Soil." (p. 1497)

MORE HELP

Doctors Smedley and Warner in "Ask ORAL HYGIENE," suggest help in 9 puzzling cases. (p. 1507)

AND MORE HELP

In the new "annex" to "Ask ORAL HYGIENE," conducted by Dr. W. Earle Craig, this month the "picture writing" is an interpretation of Dr. Kyprie's inlay impression technique by Dr. Raymond K. Hyde. Drawings by Dorothy Sterling. (p. 1510).

December ORAL HYGIENE

along the Coast, but back on the prairie, they hang yellow and cheerful in the thick night on the station house where the telegraph keys clatter in a place somewhere below the authoritative fingers of the semaphore. The price for the glass frame and the metal back and bottom was $1.50. I have a lantern some place, so this was a deal. A fifty cent bid was still open to me. There were a few ship models growing cancerous-like inside bottles, and several family portraits selling for fifty cents each. I knew what I wanted, but was mildly timid to blurt out my old suppression before a clerk in a second-hand store. When in doubt, blame it on the dog, I've been told, so I did.

"I have a big dog that sometimes runs away. I've heard that dogs hate the sound of a bell. You don't have a bell, any kind—fire, school, cow bell—that I could buy?"

"Yep, and it's just fifty cents."

That's the way I acquired my brass, throaty school bell with a hard wood handle of hickory. I guess nostalgia is the word. I see a country school house and kids in homemades. At morning, noon and recess they are called to their studies by the authority in this brass directed by a girl-teacher, no bigger and not much older than some of her pupils.

I don't know what I'll do with the bell but I won't use it on the dog, a good dog that never runs away at all. I hope, though, that when I'm in the woods or along the river, I'll hear it in the distance. Then I'll drop the axe or spade or fishing pole, spread out under a tree and say, "To hell with bullying bells." That's what I've always wanted to say.

It takes a certain degree of driving skill to manage a desk that hasn't been fastened down, a station lamp with glass sides, and a school bell—all in a down-at-the-heels farm truck. You must take it easy on the curves and grades.

Not until I came through the gate and down the driveway and saw the hired man busy with the ducks did I remember the "drop-leaf kitchen table" again—so proud was I of my morning's purchases. I hope nobody saw me when I unloaded my desk and lamp and bell in the shadow of the trees and moved them stealthily into the small room beside the chicken house. At the moment, I sit at my desk, with the hens cackling next door to themselves or at me. I don't

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Big structural advantages too! Back and stem are permanently joined by an exclusive Kerr method which leaves no crevices for dirt. Boil your Kerr Mirrors without fear. The exclusive Kerr backing seal protects against seepage.

On close inspection Kerr Mouth Mirrors will show you many other evidences of characteristic Kerr Quality. But, best of all, they will tell you only the truth about your operating field.

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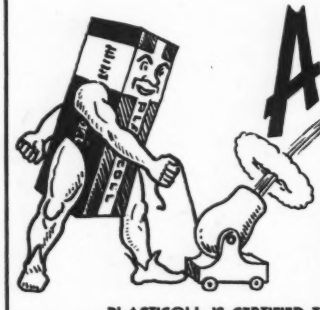

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know which. I am writing this on the desk that belonged to Squire Green. People should know better than to send me on an errand—a man's errand.—E. J. R.

CORRECTION

In the article by P. Philip Gross in last month's DIGEST, Fig. 1 appeared inverted. We apologize for this error.

Doctor Gross wishes us to clarify his title, TREATMENT OF POSTERIOR FRAGMENT IN AN EDENTULOUS FRACTURED MANDIBLE, which may have been misleading. It was only the fragment that was edentulous—not the entire mandible; thus the title might have read more clearly as TREATMENT OF POSTERIOR EDENTULOUS FRAGMENT IN A FRACTURED MANDIBLE.

DENTAL MEETING *Dates*

The Greater Philadelphia Dental Society, annual meeting, Benjamin Franklin Hotel, Philadelphia, February 4-7, 1941.

•

Chicago Dental Society, Midwinter meeting, Stevens Hotel, Chicago, February 17-20, 1941.

•

Alabama Dental Association, seventy-second annual meeting, Tutwiler Hotel, Birmingham, April 8-10.

•

Louisiana State Dental Society, sixty-first annual meeting, Hotel Roosevelt, New Orleans, May 1-3.

•

New Jersey State Dental Association, annual meeting, Berkeley, Carteret Hotel, Asbury Park, May 7-9.

•

Tennessee State Dental Association, seventy-fourth annual meeting, Hotel Andrew Johnson, Knoxville, May 12-15.

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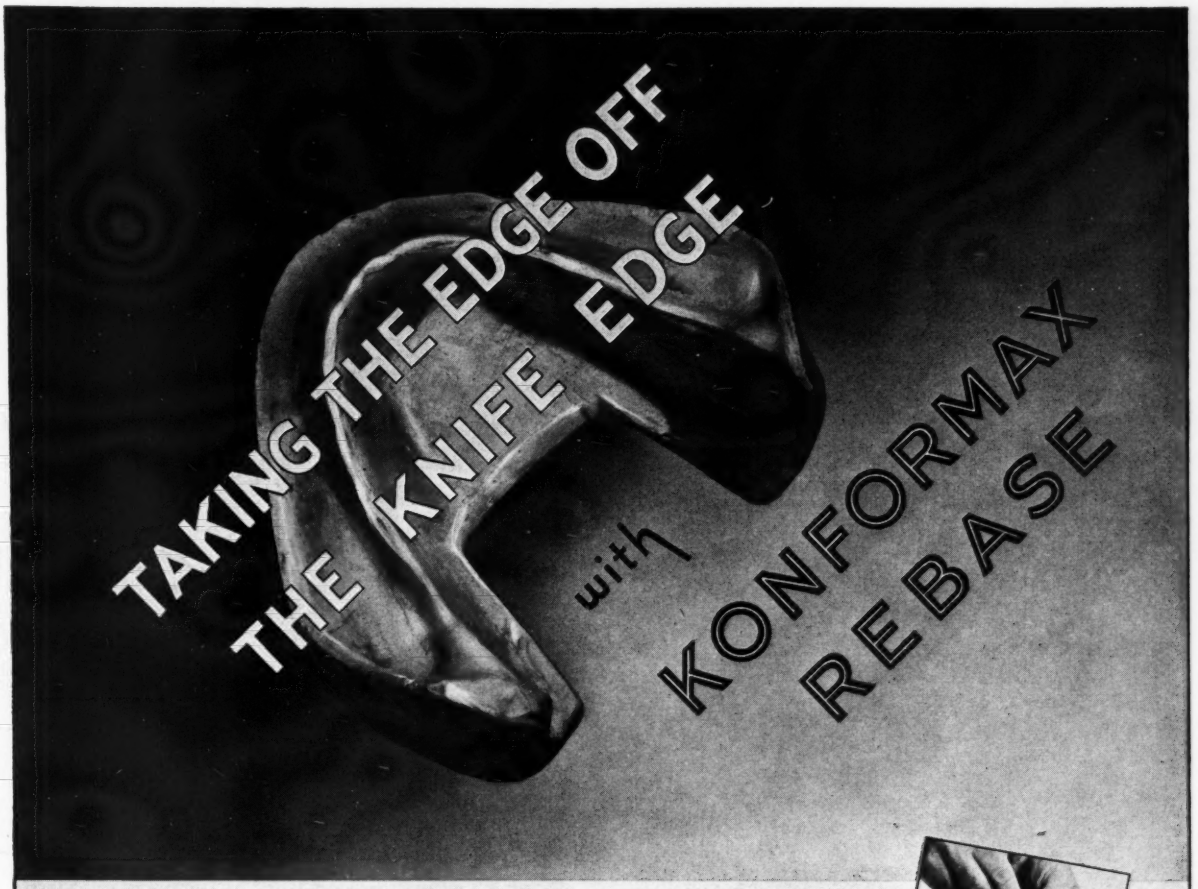

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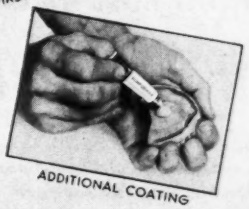
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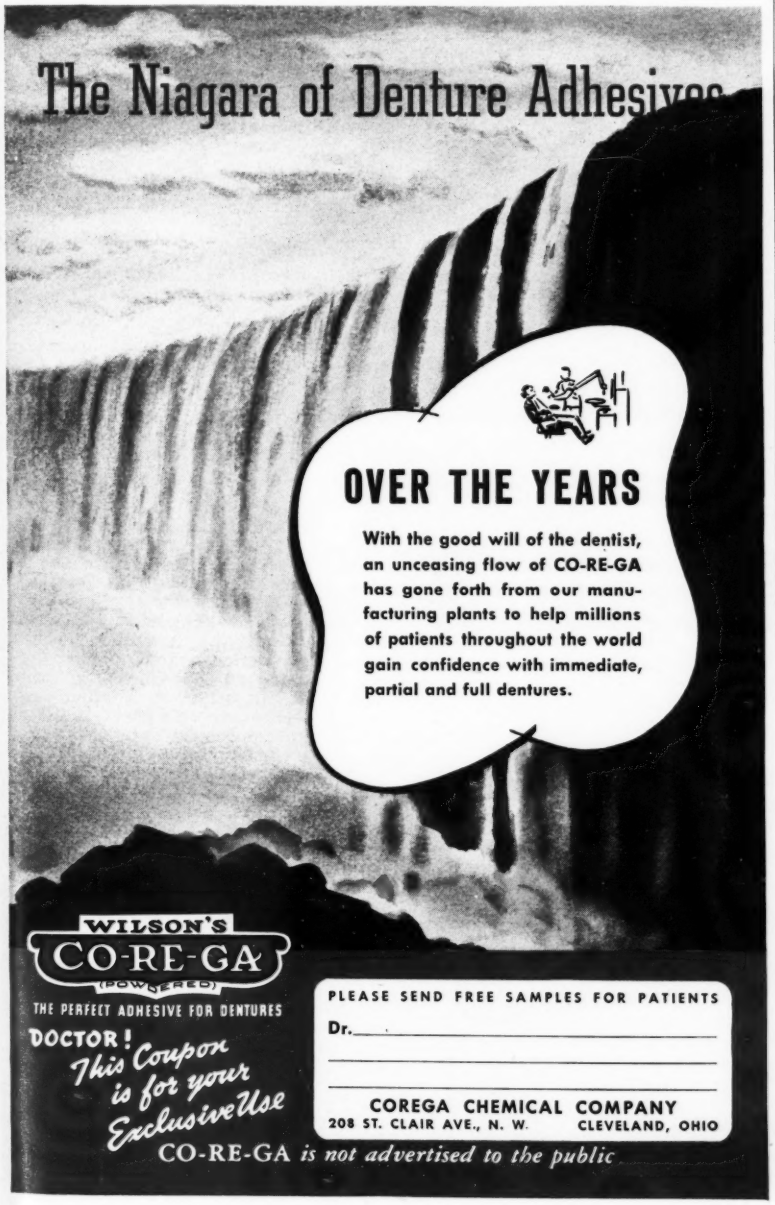
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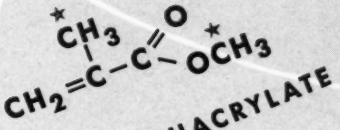

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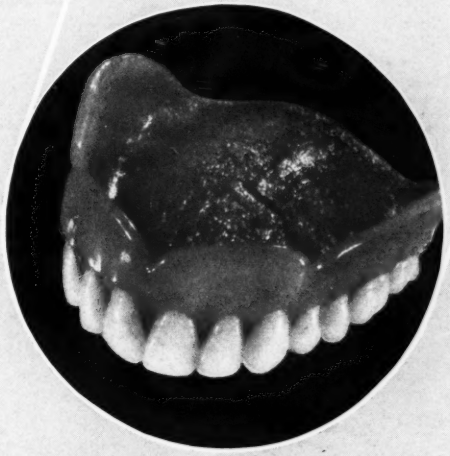

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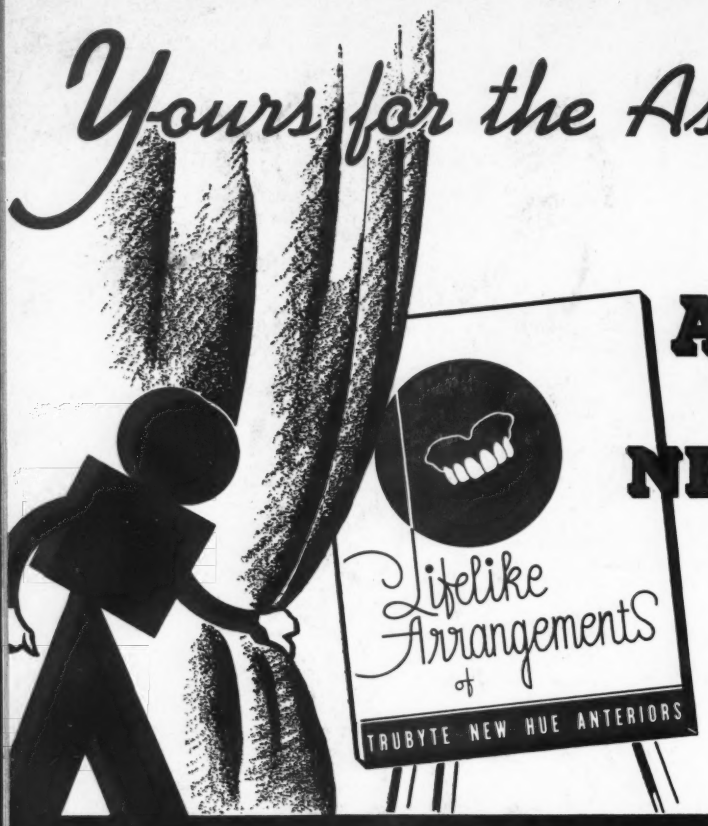

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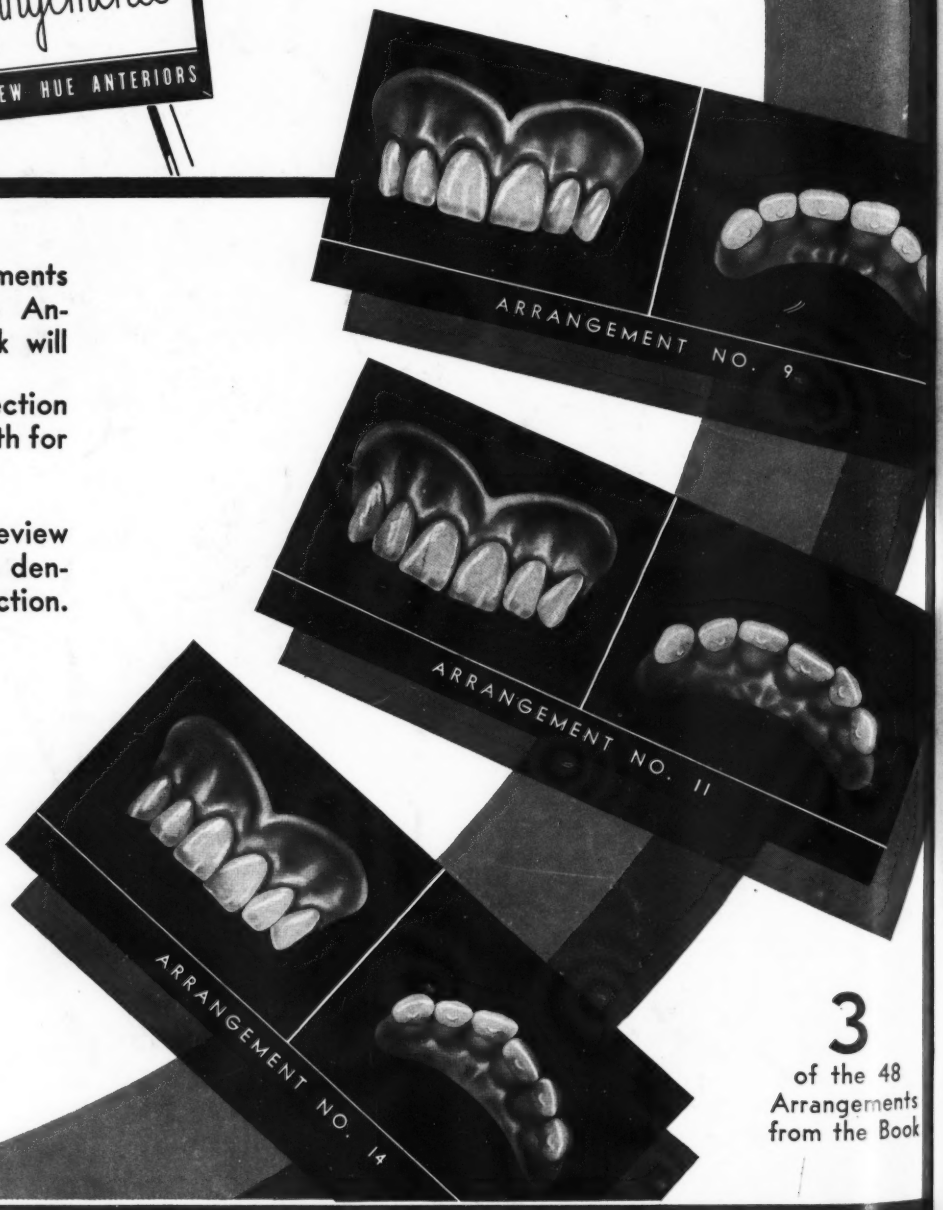

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